5. SCALING UP HIV SERVICES FOR WOMEN AND CHILDREN

Key findings

- Global and national political commitment to scale up interventions for preventing mother-to-child transmission of HIV has intensified in recent years.

- An estimated 18% of pregnant women in low- and middle-income countries received an HIV test in 2007 versus 10% in 2004.

- An estimated 33% of pregnant women living with HIV received antiretrovirals to prevent transmission to their children in 2007, a substantial increase compared with only 10% in 2004. The most significant expansion was in sub-Saharan Africa.

- An increasing number of countries are providing combination antiretroviral prophylactic drug regimens to pregnant women living with HIV, which are more effective in reducing the mother-to-child transmission of HIV than one drug alone.

- Only 12% of pregnant women identified as being HIV-positive during antenatal care were assessed to determine whether they were eligible to receive antiretroviral therapy for their own health.

- Only 8% of infants born to pregnant women with HIV in 2007 were tested for HIV within the first two months of birth. In addition, only 4% of infants born to women living with HIV initiated co-trimoxazole prophylaxis as indicated in WHO guidelines.

- The number of children receiving antiretroviral therapy increased from about 75,000 in 2005 to almost 200,000 in 2007. However, many children living with HIV are still not receiving treatment, and mortality among them remains high.
The HIV epidemic is taking a heavy toll on women and children worldwide, especially in sub-Saharan Africa. In 2007, women accounted for approximately half of all people living with HIV worldwide and for more than 60% of all infections in sub-Saharan Africa. In other regions, women still represent less than half of all people with HIV (26% in Eastern Europe and Central Asia, 29% in Asia, 43% in the Caribbean), but their proportion continues to grow (1).

An estimated 2.1 million [1.9 million to 2.4 million] children younger than 15 years were living with HIV in 2007, and more than 90% of them were infected through mother-to-child transmission (1). Children account for 6% of all HIV infections, 17% of new infections and 14% of all HIV-related mortality. About 90% of children living with HIV are in sub-Saharan Africa.

An estimated 1.5 million of the 115 million births per year in low- and middle-income countries are from mothers living with HIV. Close to 90% of all pregnant women living with HIV in low- and middle-income countries live in 20 countries, and 75% are concentrated in 12 countries (Table 5.1).

HIV is also adversely affecting the overall health of children, especially in countries with a high HIV burden. HIV has been the leading cause of death among children younger than five years of age in six countries, all in eastern and southern Africa (Table 5.2).

Without any intervention, between 15% and 45% of infants born to mothers living with HIV will become infected (5–10% during pregnancy, 10–20% during labour and delivery and 5–20% through breastfeeding) (3).

### Table 5.1. Countries with the largest estimated numbers of pregnant women living with HIV and percentage of the total number of pregnant women living with HIV in low- and middle-income countries, 2007

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Estimated number of pregnant women living with HIV</th>
<th>% of the total in low- and middle-income countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>South Africa</td>
<td>220 000 [180 000–260 000]</td>
<td>13%</td>
</tr>
<tr>
<td>2</td>
<td>Nigeria</td>
<td>190 000 [130 000–240 000]</td>
<td>13%</td>
</tr>
<tr>
<td>3</td>
<td>United Republic of Tanzania</td>
<td>100 000 [91 000–110 000]</td>
<td>7%</td>
</tr>
<tr>
<td>4</td>
<td>Mozambique</td>
<td>97 000 [81 000–120 000]</td>
<td>7%</td>
</tr>
<tr>
<td>5</td>
<td>Uganda</td>
<td>88 000 [66 000–102 000]</td>
<td>5%</td>
</tr>
<tr>
<td>6</td>
<td>Kenya</td>
<td>76 000 [68 000–86 000]</td>
<td>5%</td>
</tr>
<tr>
<td>7</td>
<td>Zambia</td>
<td>73 000 [64 000–82 000]</td>
<td>5%</td>
</tr>
<tr>
<td>8</td>
<td>Ethiopia</td>
<td>73 000 [61 000–85 000]</td>
<td>5%</td>
</tr>
<tr>
<td>9</td>
<td>Zimbabwe</td>
<td>52 000 [48 000–57 000]</td>
<td>4%</td>
</tr>
<tr>
<td>10</td>
<td>Democratic Republic of the Congo</td>
<td>38 000 [33 000–46 000]</td>
<td>3%</td>
</tr>
<tr>
<td>11</td>
<td>Cameroon</td>
<td>54 000 [44 000–62 000]</td>
<td>2%</td>
</tr>
<tr>
<td>12</td>
<td>Côte d’Ivoire</td>
<td>26 000 [21 000–34 000]</td>
<td>2%</td>
</tr>
<tr>
<td>13</td>
<td>Sudan</td>
<td>18 000 [12 000–26 000]</td>
<td>1%</td>
</tr>
<tr>
<td>14</td>
<td>Angola</td>
<td>18 000 [13 000–22 000]</td>
<td>1%</td>
</tr>
<tr>
<td>15</td>
<td>Chad</td>
<td>18 000 [10 000–22 000]</td>
<td>1%</td>
</tr>
<tr>
<td>16</td>
<td>Ghana</td>
<td>14 000 [12 000–16 000]</td>
<td>1%</td>
</tr>
<tr>
<td>17</td>
<td>Swaziland</td>
<td>13 000 [12 000–15 000]</td>
<td>1%</td>
</tr>
<tr>
<td>18</td>
<td>Lesotho</td>
<td>13 000 [11 000–14 000]</td>
<td>1%</td>
</tr>
</tbody>
</table>

### Table 5.2. Percentage of deaths attributable to HIV among children younger than five years, selected high-burden countries, 2000

<table>
<thead>
<tr>
<th>Country</th>
<th>Deaths among children younger than five years attributable to HIV (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Africa</td>
<td>57</td>
</tr>
<tr>
<td>Lesotho</td>
<td>56</td>
</tr>
<tr>
<td>Botswana</td>
<td>54</td>
</tr>
<tr>
<td>Namibia</td>
<td>53</td>
</tr>
<tr>
<td>Swaziland</td>
<td>47</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>41</td>
</tr>
</tbody>
</table>

In the Declaration of Commitment on HIV/AIDS adopted at the United Nations Special Session on HIV/AIDS in 2001 (4), countries pledged to reduce the proportion of infants with HIV by 50% by 2010 and to ensure that 80% of pregnant women attending antenatal care have access to essential services to reduce mother-to-child transmission. Global and national political commitment to scale up interventions for preventing mother-to-child transmission has intensified in recent years, and an increasing number of countries are expanding their national programmes.

In 2007, nearly all of the 20 countries with the highest number of pregnant women with HIV had developed national plans for scaling up the prevention of mother-to-child transmission and HIV treatment, care and support for children. Globally, 88 of 109 reporting countries (81%) had a plan for scaling up the prevention of mother-to-child transmission, and 68 of these included population-based targets as called for in the Abuja Call to Action (5). This represents a substantial increase from only 34 countries that had national plans with population-based targets in 2005. Sixty-two (57%) countries also reported having a plan for scaling up HIV treatment, care and support for children (and 43 of these included population-based targets), which is more than twice the number of countries with such a plan in 2005 (Fig. 5.1).

**Fig. 5.1. Number of countries with national scale-up plans and population-based targets for the prevention of mother-to-child transmission and HIV treatment, care and support for children, 2005–2007**
The United Nations recommends the implementation of a comprehensive strategic approach for preventing HIV infection among infants and children that includes four elements (Box 5.1):  
- primary prevention of HIV infection among women of childbearing age;  
- preventing unintended pregnancies among women living with HIV;  
- preventing HIV transmission from women living with HIV to their infants; and  
- providing appropriate treatment, care and support to mothers living with HIV and their children and families.

Scaling up this comprehensive range of interventions will bring countries closer to universal access goals by preventing new HIV infections in women and children; ensuring that women living with HIV and children exposed to HIV have access to treatment and care; and prolonging and preserving the quality of life for mothers, children and families.

The regional and country-level data on access to HIV services for women and children presented in this section have been compiled from information reported by national programmes in 109 countries representing 93% of pregnant women and 99% of the estimated number of pregnant women living with HIV who need antiretrovirals for reducing mother-to-child transmission.

Box 5.1. The Interagency Task Team on Prevention of HIV Infection in Pregnant Women, Mothers and their Children

The Interagency Task Team on Prevention of HIV Infection in Pregnant Women, Mothers and their Children (IATT) is co-convened by UNICEF and WHO and represented by 20 partner agencies that work on preventing mother-to-child transmission of HIV and HIV treatment and care for children. The IATT works with partners to put into operation the four elements of the comprehensive approach and supports countries in making progress towards universal access goals.

The IATT has established five working groups in areas that require additional guidance and efforts to support country-level scale-up:  
1. laboratory support  
2. HIV treatment, care and support for children  
3. infant and young child feeding  
4. primary prevention and sexual and reproductive health of people living with HIV  
5. monitoring and evaluation.

In 2007, the IATT released guidance for the global scaling up of interventions to prevent the mother-to-child transmission of HIV (7). The guidance recommends specific actions to accelerate the scaling up of activities based on the four elements and provides a framework for building partnerships among national governments, civil society and international agencies.

Recommended priority strategies and actions at the country level include:  
- government leadership, commitment and accountability to the goal of universal access to prevention of mother-to-child transmission and HIV care and treatment for children;  
- district-driven delivery of a standard package of comprehensive services;  
- provider-initiated HIV testing and counselling in maternal, newborn and child health settings;  
- longitudinal HIV care management in maternal, newborn and child health settings;  
- increased access to antiretroviral therapy for pregnant women, mothers, children and families;  
- strengthening advice on infant feeding and nutrition and counselling and support for women, their children and their families; and  
- operationalizing the link between the delivery of services for preventing the mother-to-child transmission of HIV and sexual and reproductive health care.

---

1 Data reported in response to the 2007 Report Card on Prevention of Mother-to-Child Transmission of HIV and Paediatric HIV Care and Treatment in Low- and Middle-income Countries.
5.1 Primary prevention of HIV for women of childbearing age

The number of women living with HIV worldwide has increased by 1.6 million since 2001 (1). Preventing new HIV infections among women is critical not only for their own health but also to reduce future HIV infections among infants, especially in sub-Saharan Africa, where half the female population is of childbearing age (8).

WHO and UNICEF recommend integrating primary prevention into programmes for preventing mother-to-child transmission to assist women who test HIV-negative in remaining uninfected throughout pregnancy, childbirth and breastfeeding. This is especially important because recent seroconverters are more likely to transmit HIV to their infants.

Interventions for the primary prevention of HIV include a wide range of activities provided within communities and in health facilities with two main approaches: activities aimed at changing individual-level behaviour and community-level interventions.

HIV prevention messages for individual HIV risk reduction can be disseminated in various ways such as through the mass media, information campaigns and outreach to specific groups and within health facilities. Their translation into practice can be gauged through trends in individually reported behaviour and ultimately reflected in HIV incidence if recently acquired HIV can be measured accurately at the population level.

Data from recent population-based surveys (9) show that, in most countries, less than half of men and women with more than one sexual partner in the last 12 months reported using a condom during their last sexual intercourse (Table 5.3).

Table 5.3. Percentage of women and men aged 15–49 years in selected countries who had more than one partner in the past 12 months and reported using a condom during their last sexual intercourse, 2005-2007

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>15–24 years</th>
<th>25–49 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Women</td>
<td>Men</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colombia</td>
<td>2005</td>
<td>35.5</td>
<td>...</td>
</tr>
<tr>
<td>Congo</td>
<td>2005</td>
<td>22.2</td>
<td>36.5</td>
</tr>
<tr>
<td>Côte d’Ivoire</td>
<td>2005</td>
<td>49.1</td>
<td>b1.3</td>
</tr>
<tr>
<td>Democratic Republic of the Congo</td>
<td>2005</td>
<td>4.6</td>
<td>42.3</td>
</tr>
<tr>
<td>Haiti</td>
<td>2006</td>
<td>22.6</td>
<td>50.5</td>
</tr>
<tr>
<td>Mali</td>
<td>2006</td>
<td>7.9</td>
<td>28.2</td>
</tr>
<tr>
<td>Namibia</td>
<td>2007</td>
<td>33.1</td>
<td>b2.1</td>
</tr>
<tr>
<td>Ukraine</td>
<td>2007</td>
<td>33.1*</td>
<td>43.1</td>
</tr>
</tbody>
</table>

Source: Demographic and Health Surveys [web site] (9).

a For the age group 15–49 years.
Trend data from countries with repeated population-based surveys (9) suggest that in most cases, reported condom use is increasing over time among people aged 15–49 years who had more than one partner in the past 12 months. However, condom use has declined in some countries, including among men in Côte d’Ivoire and among both men and women in Kenya (Fig. 5.2).

Health facilities provide an important setting for integrating priority HIV prevention interventions with sexual and reproductive health services for women and their sexual partners. Antenatal care settings that offer interventions for preventing mother-to-child transmission as part of a package of services can reinforce HIV primary prevention messages along with other information on HIV and routine information on antenatal care and delivery, sexually transmitted infections and family planning.

In addition, testing and counselling for couples is becoming an increasing focus for many programmes, providing an opportunity to increase the involvement of women’s sexual partners in antenatal care. Condom promotion and distribution are also being integrated as a component of the package in many countries.

However, scaling up the provision of primary prevention services in the context of preventing mother-to-child transmission is hampered by several societal and structural barriers such as the overall lack of involvement of male partners and the shortage of skilled health care providers.

Fig. 5.2. Percentage of women and men aged 15–49 years who had more than one partner in the past 12 months and reported using a condom during their last sexual intercourse in selected countries with repeat demographic and health surveys, 1998–2007

Source: Demographic and Health Surveys [web site] (9).
Several programmes in resource-limited settings are adopting approaches such as task-shifting and the use of less specialized health care workers, including community counsellors and people living with HIV, to address these concerns. Such approaches not only contribute to reducing the workload of more specialized health care workers but also facilitate individual post-test counselling for both HIV-positive and HIV-negative women (10).

5.2 Preventing unintended pregnancies among women living with HIV

The prevention of unintended pregnancies among women living with HIV can be facilitated when they come into contact with health services providing HIV testing and counselling, reproductive health services, maternal and child health care and HIV care and antiretroviral therapy enabling women to time and space their pregnancies also leads to improvement in their health and can reduce maternal mortality and increase child survival.

Globally, about 80 million unintended pregnancies occur every year because an estimated 120 million couples have an unmet need for safe and effective contraception (11). Unmet need for contraception and family planning refers to the proportion of all women who are at risk of pregnancy and want to space or limit their childbearing but are not using contraception. Sub-Saharan Africa has the lowest levels of contraceptive use, with only 22% of women of reproductive age who are married or in union using any family planning method (with 15% using a modern method) (14). As a result, nearly 27 million women in sub-Saharan Africa have an unmet need for contraception. Meeting the contraceptive needs of these women, including women with HIV, will greatly reinforce efforts to reduce the number of HIV infections among infants.

Facility-based data from some settings confirm the existence of unmet need for family planning among women living with HIV. Studies undertaken by Family Health International have documented levels of unmet need ranging from 9% to 14% among clients of antiretroviral therapy services in Ghana (15). Studies in Côte d’Ivoire, South Africa and Uganda have revealed higher levels of unintended pregnancies among women with HIV, ranging from 51% to 99% (16,17).

Women living with HIV who know their status are in particular need of sexual and reproductive health services to make informed decisions about their future reproductive life, including when to seek appropriate support and services to prevent unintended pregnancies (18). Many studies have emphasized the need to address both family planning and HIV prevention (19). Male and female condoms are the only contraceptive methods that protect against the transmission of HIV and other sexually transmitted diseases as well as unwanted pregnancy. Family planning is now a recommended component of most services for preventing mother-to-child transmission. Antenatal care programmes are also beginning to offer contraceptive information to promote postpartum use (20).

Scaling up such functional integration between services for preventing mother-to-child transmission and reproductive health programmes will enable countries to maximize HIV prevention and to improve maternal and child health outcomes (Box 5.2).

Box 5.2. Integrating sexual and reproductive health services with HIV services

Priority interventions to integrate sexual and reproductive health services with HIV services include:

- promoting and providing condoms (male and female) as a means of protection against both unintended pregnancy and sexually transmitted infections, including HIV;
- providing or referring to sexual and reproductive health services that include counselling on reproductive choices for people living with HIV, planning for a pregnancy, protecting against a pregnancy or interrupting an unintended pregnancy where abortion is legal;
- ensuring postpartum maternal health services that provide counselling about and offer family planning methods, including condoms; and
- providing advocacy and education on sexual health within HIV care and treatment services, reproductive health settings and youth-friendly services as an effective means of changing risk-taking behaviour that can potentially result in reduced unintended pregnancy and sexually transmitted infections, including HIV, and other illnesses related to sexual and reproductive health.

---

2 Unmet need constitutes: “Women who are at risk of pregnancy (fecund) who desire to either stop childbearing or postpone their next birth for at least two years, or who are undecided about it or when to have another child, and who are not using a contraceptive method, and who are pregnant or amenorrhoeic and whose pregnancies were unwanted or mistimed, among all women of reproductive age (15–49) who are married or in consensual union.” (12,13).

3 Family planning method can be used interchangeably with contraceptive method. It includes clinic and supply (modern) methods and non-supply (traditional) methods. Traditional methods include rhythm, withdrawal, abstinence and lactational amenorrhoea. Modern methods include female and male sterilization, intrauterine devices (IUDs), hormonal methods (oral pills, injectable and hormone-releasing implants, skin patches and vaginal rings), condoms and vaginal barrier methods (diaphragms, cervical cap and spermicidal foams, jellies, creams and sponges). Surgical sterilization is usually considered to be contraception only if the operation is performed at least partly to avoid having more children (sterilization is also carried out solely for health reasons).
5.3 Preventing the vertical transmission of HIV from mother to child

Reducing HIV transmission from a pregnant woman living with HIV to her infant requires a range of interventions beginning with HIV testing and counselling for pregnant women; followed by antiretroviral prophylaxis for pregnant women with HIV and their newborn baby or antiretroviral therapy for the mother if eligible; safe obstetric interventions; and counselling and support for safer infant feeding options.

5.3.1 HIV testing and counselling

Global coverage of HIV testing among pregnant women has increased in recent years (Fig. 5.3). About 18% of the total estimated number of pregnant women in low- and middle-income countries (20.6 million of 115 million pregnant women) received an HIV test in 2007, compared with 16% in 2006 and 10% in 2004 and 2005. The percentages are slightly higher among women attending antenatal care during their pregnancy, with 21% tested in 2007 versus 13% in 2004.

Despite this progress, the overall level of testing remains low in all regions except Europe and Central Asia. In the 10 countries with the highest estimated numbers of pregnant women with HIV worldwide, HIV testing coverage among pregnant women varies between 4% in Nigeria to 64% in South Africa and 65% in Zambia.

Antenatal care coverage is relatively high in most low- and middle-income countries. This provides an important window of opportunity for health care providers to routinely recommend HIV testing and counselling to pregnant women as part of a comprehensive package of interventions for antenatal care and delivery. For example, both South Africa and Zambia have high rates of antenatal care coverage (92% and 93% respectively) and a corresponding high proportion of pregnant women tested for HIV (64% and 65% respectively) relative to the regional average.

Introducing provider-initiated testing and counselling and rapid HIV testing into the standard package of antenatal care and delivery services in high prevalence countries has been shown to significantly increase access to services for

Fig. 5.3. Percentage of pregnant women in low- and middle-income countries receiving an HIV test, 2004–2007

No data are available for the Middle East and North Africa.
preventing mother-to-child transmission and has often been the factor determining high levels of HIV testing in antenatal care settings (6,21). Provider-initiated testing and counselling in antenatal care settings is implemented widely in Europe and the United States (Fig. 5.4). In 2007, 87 of 109 low- and middle-income countries reported the implementation of provider-initiated testing and counselling in all or in some sites, compared with 82 of 108 reporting countries in 2006 and 62 of 79 reporting countries in 2005. Among countries in sub-Saharan Africa, Botswana introduced provider-initiated testing and counselling in pregnant women as part of routine care in 2004. Within six months, antenatal HIV testing increased from 75% to 95% (23). A recent study in urban Zimbabwe (24) showed that HIV testing rates increased from 65% to 99% in the first six months where a policy on provider-initiated testing and counselling was implemented.

In the absence of provider-initiated testing and counselling, on-site testing rates often remain low, even where antenatal care attendance rates are high. This is primarily because the test is not offered but also due to several other factors such as the unavailability of tests, inadequate counselling and fear of stigma (25).
5.3.2 Antiretrovirals for preventing mother-to-child transmission

A pregnant woman with HIV must be assessed to determine whether she is eligible to receive antiretroviral therapy. When antiretroviral therapy is not indicated for her own health, pregnant women with HIV should receive combination antiretroviral prophylaxis to prevent HIV transmission to their infants (26). Both antiretroviral prophylaxis for mothers not eligible to receive antiretroviral therapy for their own health and antiretroviral therapy for those who are eligible are effective at reducing the vertical transmission of HIV.

HIV-exposed infants also require antiretroviral prophylaxis as soon after delivery as possible. Combination regimens result in the greatest reduction of transmission and are always required if the mother did not receive antiretroviral prophylaxis. Research is ongoing on the role of extended antiretroviral prophylaxis among infants who continue to be at risk of acquiring HIV through breastfeeding and in the context of greater access to maternal antiretroviral therapy.

About 33% of pregnant women living with HIV received antiretrovirals to prevent mother-to-child transmission in 2007 (491,000 of the total estimated 1.5 million pregnant women living with HIV). This represents a noteworthy increase from 23% in 2006, 15% in 2005 and 10% in 2004 (Fig. 5.5). Certain countries have succeeded in dramatically reducing transmission by increasing the coverage of interventions to prevent mother-to-child transmission. The estimated mother-to-child transmission declined from 30.5% in 2001 to 11.4% in 2007 in Cambodia and from 30.5% in 2001 to 8.9% in 2007 in Rwanda4.

Table 5.4 provides recent estimates of the number of women who need antiretrovirals (both antiretroviral prophylaxis and antiretroviral therapy) to prevent mother-to-child transmission in 2007.

Fig. 5.5. Coverage of antiretrovirals to prevent mother-to-child transmission of HIV in low- and middle-income countries, 2007

---

4 Estimates based on country data, UNAIDS/WHO estimates and projections using Spectrum software.
Table 5.4. Estimated number of pregnant women with HIV receiving and needing antiretrovirals for preventing mother-to-child transmission and percentage coverage in low- and middle-income countries according to region, 2007

<table>
<thead>
<tr>
<th>Geographical region</th>
<th>Number of pregnant women with HIV receiving antiretrovirals for preventing mother-to-child transmission, 2007</th>
<th>Estimated number of pregnant women living with HIV needing antiretrovirals for preventing mother-to-child transmission, 2007 (range)</th>
<th>Estimated percentage of pregnant women living with HIV receiving antiretrovirals for preventing mother-to-child transmission, 2007 (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-Saharan Africa</td>
<td>446 000–1 300 000</td>
<td>1 200 000–1 400 000</td>
<td>34% [32–37%]</td>
</tr>
<tr>
<td>Eastern and southern Africa</td>
<td>43 000–22 000</td>
<td>38% [30–48%]</td>
<td>11% [10–13%]</td>
</tr>
<tr>
<td>West and central Africa</td>
<td>13 000–27 000</td>
<td>38% [30–48%]</td>
<td>36% [29–43%]</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>10 000–19 000</td>
<td>32% [27–38%]</td>
<td>10% [9–12%]</td>
</tr>
<tr>
<td>Latin America</td>
<td>1 200 000–1 400 000</td>
<td>32% [27–38%]</td>
<td>10% [9–12%]</td>
</tr>
<tr>
<td>Caribbean</td>
<td>2 300–7 200</td>
<td>32% [27–38%]</td>
<td>10% [9–12%]</td>
</tr>
<tr>
<td>Europe and Central Asia</td>
<td>10 000–14 000</td>
<td>71% [53–91%]</td>
<td>10% [9–12%]</td>
</tr>
<tr>
<td>Middle East and North Africa</td>
<td>&lt;100–19 000</td>
<td>&lt;1% [ &lt;1%]</td>
<td>10% [9–12%]</td>
</tr>
<tr>
<td>East, South and South-East Asia</td>
<td>22 000–100 000</td>
<td>22% [16–31%]</td>
<td>10% [9–12%]</td>
</tr>
<tr>
<td>All low- and middle-income countries</td>
<td>491 000–1 500 000</td>
<td>33% [31–35%]</td>
<td>10% [9–12%]</td>
</tr>
</tbody>
</table>

Note: some numbers do not add up due to rounding. For an explanation of the methods used, see explanatory notes to Annex 3.

Sub-Saharan Africa, which accounts for nearly 90% of all pregnant women living with HIV in low- and middle-income countries, has made the most progress in the past three years. In western and central Africa, the number of pregnant women with HIV who received antiretrovirals to prevent mother-to-child transmission increased 25-fold between 2004 and 2007 (Fig. 5.6). However, despite this increase, only 11% [range 10–13%] of pregnant women who needed antiretrovirals had access in 2007 in this subregion. Coverage with antiretrovirals in eastern and southern Africa, which includes 12 of the 20 countries with the highest numbers of pregnant women with HIV, increased four-fold, reaching 403 000 women in 2007 versus 106 700 women in 2004 (coverage of 43% [range 40–47%]).

Fig. 5.6. Percentage of pregnant women with HIV receiving antiretrovirals for preventing mother-to-child transmission of HIV in low- and middle-income countries, 2004–2007

The bar indicates the uncertainty range around the estimate.
a For an explanation of the methods used, see explanatory notes to Annex 3.
b Values for Eastern and southern Africa and West and central Africa are included in sub-Saharan Africa.

PROGRESS REPORT 2008 89
The coverage of antiretrovirals for preventing mother-to-child transmission varies among the 10 countries that have the largest number of pregnant women with HIV. In South Africa, home to more than 200,000 pregnant women living with HIV in 2007, the coverage of antiretrovirals for preventing mother-to-child transmission increased from 15% in 2004 to 57% in 2007 (Fig. 5.7). Coverage increased from 3% to 46% in Mozambique and from 25% to 69% in Kenya during the same time period.

Coverage also increased substantially in other countries between 2004 and 2007, including Cambodia (7% in 2004 to 32% in 2007), Central African Republic (2% to 34%), Ghana (1% to 21%), Guyana (21% to 43% in 2006), India (5% to 14%) and Thailand (48% to 92%).

However, progress has been slower in some large countries such as the Democratic Republic of the Congo, Ethiopia and Nigeria, where the coverage of antiretrovirals for preventing mother-to-child transmission remained below 10% in 2007. Urgent efforts are needed to scale up access to services in these countries to meet the target adopted by the United Nations General Assembly Special Session on HIV/AIDS which includes 80% coverage of antiretrovirals to reduce mother-to-child transmission.

The coverage of antiretroviral prophylaxis among infants born to women with HIV follows a similar trend, increasing from 7% in 2004 to 12% in 2005, 18% in 2006 and 20% by the end of 2007 (Fig. 5.8). The widening gap between coverage of antiretrovirals for mothers and for infants raises concern and needs to be addressed (Box 5.3).

**Fig. 5.7.** Percentage of pregnant women living with HIV receiving antiretrovirals for preventing mother-to-child transmission of HIV in the 10 countries with the highest estimated number of pregnant women living with HIV, 2007

![Graph showing coverage of antiretrovirals for preventing mother-to-child transmission in 10 countries](image)
Box 5.3. Involving male partners, families and communities

Stigma, domestic violence and lack of male involvement in antenatal care often discourage women from accessing services to prevent mother-to-child transmission (28–31). Providing support to these women, including from their partners, families and communities, should be key components of all programmes for preventing mother-to-child transmission.

Several pilot projects have demonstrated improved outcomes when male partners are encouraged to take an HIV test and are involved in counselling and care for women (32). In a health centre in Mwanza, United Republic of Tanzania, the involvement of male partners in counselling increased ten-fold and male partner testing by 30% within the first month of introducing a strategy to issue formal invitations to male partners. In Cambodia, women attending a “mother class” that offered testing and counselling for preventing mother-to-child transmission were four times more likely to accept testing if their partners also attended the class (33).

A community-based mothers2mothers (m2m) programme was introduced in Western Cape, South Africa in 2001 to provide information, psychosocial mentoring and emotional support to pregnant and postpartum women with HIV and increase their utilization of health services (34). By 2007, there were more than 100 m2m sites throughout South Africa. m2m employs new mothers as “mentor mothers” to support other women living with HIV through one-on-one and group support sessions in antenatal, maternal, newborn and child health care settings. Although it does not provide HIV testing or other health services, m2m helps to increase uptake of services by reducing stigma, misinformation and cultural barriers to access.

A recent study found that m2m programmes have resulted in increased access to antiretrovirals to prevent mother-to-child transmission for women and infants, safer infant feeding practices, increased numbers of women receiving a CD4 test and improved use of family planning post-pregnancy (35). Drawing on this successful model, pilot sites have also been established or are planned in nine other countries in eastern and southern Africa (34).
5.3.3 Antiretroviral regimens

The effectiveness of antiretrovirals in preventing mother-to-child transmission varies with the type and combination used and the duration of treatment. Simple, short-course antiretroviral drug regimens have been proven to reduce mother-to-child transmission, but combination regimens (such as zidovudine and single-dose nevirapine) taken for longer periods of time are more effective (36,37).

WHO guidelines (26) recommend the use of more efficacious prophylactic antiretroviral regimens for preventing mother-to-child transmission. They highlight the need to increase efforts to ensure that women who are eligible for antiretroviral therapy have access to treatment based on the scientific and programmatic rationale regarding the effectiveness and safety of various regimens (26).

In 2007, 60 countries\(^5\) provided disaggregated data on antiretroviral regimens used to prevent mother-to-child transmission. These data reveal that 49% of women (119 400 out of 242 000) received single-dose nevirapine in 2007, 26% (62 000) received a regimen using a combination of two antiretroviral drugs and 8% (18 800) received a regimen using a combination of three antiretroviral drugs (Fig. 5.9).

In sub-Saharan Africa, more than half the reporting countries (26 of 44 countries) provided disaggregated data on the use of antiretroviral regimens in 2007. Among these countries, 50% of the total number of pregnant women with HIV receiving antiretrovirals for preventing mother-to-child transmission received single-dose nevirapine, 27% received a prophylactic regimen using a combination of two antiretroviral drugs.

---

\(^5\) These 60 countries account for about 60% (911 500) of the 1.5 million estimated pregnant women living with HIV in low- and middle-income countries. The regional distribution of the 60 countries are: East, South, and South-East Asia, 9 countries; Eastern Europe and Central Asia, 12 countries; Latin America and the Caribbean, 8 countries; North Africa and the Middle East, 5 countries; and sub-Saharan Africa, 26 countries.
6% received a highly active regimen for prophylaxis to prevent mother-to-child transmission using a combination of three antiretroviral drugs and 9% received antiretroviral therapy for their own health (for pregnant women living with HIV eligible for treatment).

Between 2006 and 2007, all regions reported a decrease in the number of countries using single-dose nevirapine as the most common antiretroviral regimen for preventing mother-to-child transmission. An increasing number of countries are shifting towards a national policy of providing more effective antiretroviral prophylactic regimens to pregnant women living with HIV. However, monitoring and evaluation systems in many countries cannot yet capture these data. As a result, accurate global data on the proportion of women accessing more efficacious regimens are currently not available.

5.3.4 Infant feeding

HIV can be transmitted from a mother to her child through breastfeeding. Without intervention, breastfeeding carries an additional transmission risk of about 5–20%, depending essentially on the disease status of the mother (measured by viral load and CD4 count), the duration and mode of breastfeeding and the existence of mastitis and breast abscess.

However, not breastfeeding carries important health risks to the infant, such as diarrhoeal disease, respiratory illness, malnutrition and increased mortality, especially if access to clean water is not assured.

In 2006, a technical consultation on HIV and infant feeding organized by United Nations agencies reviewed the most recent scientific evidence and programmatic experience in this area (37). WHO and UNICEF have also developed a package of guidance and tools in collaboration with partners (38) to assist countries in designing and implementing policies and guidelines on infant feeding when the mother has HIV (Box 5.4). Many countries now have such policies in place.

A recent study in Côte d’Ivoire where antiretroviral prophylaxis and free infant formula were offered to pregnant women living with HIV (39) provides evidence to support these recommendations. In this study and similar settings, the combined risk of HIV infection and death by 18 months of age among children who were breastfed for 3–6 months was similar to that among children who were formula-fed from birth (40). Exclusive breastfeeding has also been shown to carry a lower risk of HIV transmission than mixed feeding (breastfeeding as well as feeding the infant other fluids or foods during the first six months of life) (41). A recent study of an outbreak of infant diarrhoea in Botswana also found significantly higher rates of mortality among non-breastfed infants than among those who were breastfed, regardless of HIV status (42).

Since many women living with HIV are unaware of their HIV status, promoting exclusive breastfeeding for the general population will probably lead to lower rates of HIV transmission among women living with HIV who do not know their HIV status (43). The rates of exclusive breastfeeding among infants younger than six months of age have been slowly increasing worldwide, up by about 5–6 percentage points in the last 15 years to 39% as of 2005 (44). Some countries such as Cambodia have had great success in increasing exclusive breastfeeding rates, from about 11% in 2000 to about 60% in 2005 (45).

Outside research studies, few countries routinely report the infant feeding practices of women with HIV. Efforts are underway to implement a standardized indicator to monitor infant feeding practices among infants born to mothers with HIV. In Botswana’s national programme, where formula is provided free of charge to all women with HIV, 97% of pregnant women living with HIV reportedly choose formula-feeding (46). This proportion is lower in places that do not offer formula free of charge or where counsellors are able to fully explain the benefits and risks of different infant feeding options to mothers and support them in making a decision appropriate to their circumstances. In a research study in South Africa in which high-quality infant feeding counselling was made available, 9% of women living with HIV initially chose formula-feeding (47).

Box 5.4. Recommendations on HIV and infant feeding

The key recommendations on HIV and infant feeding indicate the following.

- The most appropriate infant feeding option for a mother with HIV depends on her individual circumstances, including her health status and the local situation, but should take into consideration available health services and the counselling and support she is likely to receive.
- Exclusive breastfeeding is recommended for infants of mothers living with HIV for the first six months of life unless replacement feeding is acceptable, feasible, affordable, sustainable and safe for them and their infants before that time.
- When replacement feeding is acceptable, feasible, affordable, sustainable and safe, avoidance of all breastfeeding by mothers living with HIV is recommended.
Increasing evidence also indicates that giving women with HIV antiretroviral therapy can reduce the risk of transmitting HIV to their infants through breastfeeding. The benefits of this approach for women who need antiretroviral therapy for their own health are clear. However, new data are awaited on the use of this strategy for breastfeeding women not yet eligible for treatment, for example, data on when antiretroviral therapy can be safely discontinued, and on safety for the infant.

In addition to infant feeding choices in the first months of life, countries also face the challenge of supporting mothers to ensure optimal feeding of their infants after six months of age, when exclusive breastfeeding or formula-feeding alone is no longer adequate. Several countries are pilot-testing different approaches for feeding non-breastfed children of women living with HIV, including providing enriched foods. WHO has developed guidance on feeding infants and children 6–24 months of age to assist countries in developing their policies in this area (48).

5.4 Treatment, care and support for women living with HIV and their children

The fourth element of the strategy for preventing mother-to-child transmission is providing treatment, care and support to mothers living with HIV, their children and their families. Until recently, the primary focus of programmes for preventing mother-to-child transmission had been to increase access to antiretrovirals to prevent transmission. Less emphasis was placed on ensuring that women in need have access to treatment services and that infants born to mothers living with HIV receive appropriate interventions including early diagnosis, co-trimoxazole preventive treatment and antiretroviral therapy. With the rapidly expanding availability of HIV care and treatment, strengthening links between services for preventing mother-to-child transmission and services providing HIV care and treatment is essential.

5.4.1 Increasing access to antiretroviral therapy for pregnant women

Treatment for pregnant women who are eligible to receive antiretroviral therapy is vital to reducing mother-to-child transmission and morbidity and mortality among women. However, many pregnant women living with HIV miss the opportunity to have timely access to antiretroviral therapy because health care workers are unable to appropriately assess their need for antiretroviral therapy, or due to lack of access to such services.

Data reported by national governments indicate that only about 12% of pregnant women living with HIV identified during antenatal care were assessed for their eligibility to receive antiretroviral therapy in 2007, either clinically through an assessment of clinical symptoms, or immunologically by determining their CD4 cell count.

Relying on clinical signs and symptoms alone can mean that some women with severe immunosuppression but without evident disease (WHO clinical stage 3 or stage 4) may not be identified as needing antiretroviral therapy. CD4 testing should be made more available to women as part of antenatal, delivery and postpartum care by increasing the availability of machines at the district level and ensuring that pregnant women are included in CD4 monitoring (Table 5.5).

Table 5.5. Availability of CD4 testing in antenatal care facilities, selected countries, 2007

<table>
<thead>
<tr>
<th>Country</th>
<th>% of facilities providing antenatal care that provide CD4 testing on site or have systems for collection and transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botswana</td>
<td>100</td>
</tr>
<tr>
<td>Central African Republic</td>
<td>2</td>
</tr>
<tr>
<td>Haiti</td>
<td>55</td>
</tr>
</tbody>
</table>
Testing pregnant women for HIV hence not only provides an entry point for them to receive interventions to prevent transmission to the child but also facilitates the enrolment of women, their families and future infants into longitudinal HIV prevention, care and treatment. Linking HIV services to maternal, newborn and child health services is necessary to ensure that women identified as living with HIV who need treatment can receive the necessary interventions to maximize their health and reduce transmission to their infants and partners.

5.4.2 Diagnosing HIV among infants

Without care and treatment, about one third of children living with HIV will die in their first year of life and almost 50% by the second year of life. Early infant diagnosis of HIV among HIV-exposed children and adequate follow-up are essential to effectively identify infants living with HIV and ensure the timely initiation of care and treatment.

However, standard HIV antibody testing cannot identify infected infants in their first year of life, as it detects maternal HIV antibodies that are transferred to the baby during pregnancy (and subsequently decline slowly in the first year of life). More demanding testing methods that rely on detecting HIV, otherwise called virological tests, are required for diagnosing young infants. As infants with HIV frequently progress to severe disease or death without prior warning symptoms or signs, testing needs to be recommended for all HIV-exposed infants to detect HIV infection.

Where virological testing is unavailable, infants still need to be closely monitored, and clinical algorithms and HIV antibody and CD4 tests are needed to identify infected infants and children as early as possible (51). HIV antibody testing can be used to identify HIV-exposed infants and, combined with close follow-up, may allow early recognition of infants with HIV and their referral for assessing the possible need for HIV treatment.

In 2007, 77 countries (71% of all reporting low- and middle-income countries) provided data on early testing of infants and young children. Of the 715 000 infants born to women living with HIV in 2007 in these countries, only 8% (54 900) were tested within the first two months of birth.

Virological testing detects HIV DNA or RNA. HIV DNA testing (and HIV antibody testing) can also be reliably performed on specimens collected onto filter paper (dried blood spots) and sent to laboratories with capacity for testing. The use of dried blood spots only requires a few drops of blood from an infant. Once specimens are collected, they can be easily stored and transferred without cold-chain systems to centralized testing locations for analysis. The use of dried blood spots enables blood samples to be collected in remote locations and allows countries with a limited number of specialized laboratories to expand access to virological testing.

Scaling up the use of dried blood spots has resulted in a significant increase in access to virological testing. The number of countries using dried blood spots for virological testing increased from 17 in 2005 to 30 in 2007 (Fig. 5.10).

Even where virological testing is available through the use of dried blood spots, transport time and logistics can still pose barriers to providing timely results. In addition, results may arrive at the facility but the infant may not be referred to HIV clinical services in a timely manner.

Maternal, newborn and child health clinics, where a child often receives his or her first set of vaccinations, provide important opportunities to identify and test infants and children who are known to be exposed to HIV. Several countries, including

![Fig. 5.10. Number of low- and middle-income countries with virological testing and policies for provider-initiated testing and counselling for infants and young children, 2005–2007](image-url)
Cameron, Malawi, Rwanda, Swaziland, United Republic of Tanzania and Zimbabwe (Box 5.5), have begun to document the mother’s HIV status on the mother’s and/or child’s health card to facilitate the identification of HIV-exposed infants and provide appropriate diagnostic and follow-up services.

However, most children are entering HIV care and treatment programmes for children at an older age after being identified in acute and chronic care facilities rather than as a follow-up of services for preventing mother-to-child transmission. HIV-exposed infants need to be followed up better as part of the package of services to prevent mother-to-child transmission to identify HIV-infected infants.

In countries such as Malawi and Zambia, provider-initiated testing and counselling for sick children has helped to substantially increase the numbers of HIV-infected infants and children who are identified. WHO and UNICEF are working with partners to develop operational guidance on provider-initiated testing and counselling for children.

**Box 5.5. Documenting the mother’s HIV status on the child health card in Zimbabwe**

In Zimbabwe, the mother’s HIV status is documented on the child health card so that health workers seeing the child at his or her six-week visit can provide appropriate care to the child. This includes referral for virological testing to determine whether the child has been infected with HIV and requires referral to treatment services.

However, most children are entering HIV care and treatment programmes for children at an older age after being identified in acute and chronic care facilities rather than as a follow-up of services for preventing mother-to-child transmission. HIV-exposed infants need to be followed up better as part of the package of services to prevent mother-to-child transmission to identify HIV-infected infants.

**5.4.3 Co-trimoxazole prophylaxis**

Co-trimoxazole is a highly efficacious, affordable, cost-effective and widely available antibiotic that has been shown to significantly reduce morbidity and mortality among infants and children who are living with or are exposed to HIV. It has been part of the standard of care for preventing and treating *Pneumocystis jirovecii pneumonia* (PCP) since the early 1990s (52). In 2006, WHO released guidance on the use of co-trimoxazole preventive therapy for children, adolescents and adults (53), recommending that all HIV-exposed infants be treated with co-trimoxazole until they are no longer at risk of infection through breastfeeding and an HIV-negative status has been established. Most pneumocystis infections occur among infants younger than six months old (54), which reinforces the need for timely provision of co-trimoxazole prophylaxis.

The limited data available on the provision of co-trimoxazole prophylaxis suggest that, although many national policies and recommendations now include co-trimoxazole prophylaxis, its implementation is poor. In 2007, less than 58 000 (4%) of the 1.5 million children born to pregnant women with HIV initiated co-trimoxazole by two months of age. Reasons for low coverage include the lack of national-level guidance to health care providers on co-trimoxazole prophylaxis, the lack of opportunities to document its provision in registers or child health cards and erratic supply and frequent stock-outs of drugs.

Scaling up co-trimoxazole prophylaxis for infants and children is essential and can markedly reduce morbidity and mortality among children caused by HIV simply and at low cost.
5.4.4 Antiretroviral therapy for children

HIV infection that infants acquire during pregnancy or around the time of delivery appears to progress very rapidly. In addition, a recent study indicated that early treatment of asymptomatic infants with HIV dramatically reduces the mortality rate (55). Children living with HIV in low- and middle-income countries have been observed to have treatment outcomes comparable to those in adult population groups, with similar patterns of improved survival associated with initiating antiretroviral therapy at earlier stages of disease progression (56). Studies also confirm that children in high-income, middle-income and low-income countries all respond well to treatment.

Recent studies in resource-limited settings confirm that disease progression and death occurs very rapidly in the first few months of life among infants acquiring HIV at or around delivery. More than 80% of surviving infants develop the eligibility criteria for starting antiretroviral therapy within the first six months of life (55,57). A randomized clinical trial conducted in South Africa observed a 75% reduction in mortality among infants who started antiretroviral therapy as soon as they were diagnosed with HIV compared with infants who started treatment based on immunological or clinical criteria. Other research and observational data also suggest that providing antiretroviral therapy early in infancy avoids death and disease progression.

Previously, recommendations to initiate antiretroviral therapy among children were based on an immunological and clinical assessment before initiating treatment, and treatment was recommended only for the most severely affected children. In April 2007, WHO convened a guideline review meeting to examine the new evidence and consider the need to revise the existing recommendations. Experts recommended that revised criteria be developed for initiating antiretroviral therapy among infants. WHO therefore now recommends that all infants younger than one year of age with confirmed HIV infection should start antiretroviral therapy, irrespective of clinical or immunological stage.

This revised recommendation will have implications for national HIV programmes and for the estimation of HIV infection among infants and children. A special meeting of the UNAIDS Reference Group on Estimates, Modelling and Projections will be held in July 2008 to review the methods and assumptions underpinning the estimation of the burden of HIV among children to produce better estimates of the number of infants and children who need antiretroviral therapy.

This report only provides data on the number of children receiving antiretroviral therapy. Revised estimates of the antiretroviral therapy need among children will be used to assess the coverage of antiretroviral therapy among children in the next report.
A total of 5,660 facilities were reported to be providing antiretroviral therapy to children in 2007, more than twice the 2,400 facilities in 2005 (Fig. 5.11). The number of facilities providing antiretroviral therapy to children in eastern and southern Africa has increased notably. Increased early infant diagnosis and case-finding and simplified care management for children have contributed to the expansion in the number of sites providing antiretroviral therapy to children.

As of December 2007, about 198,000 children globally were receiving antiretroviral therapy, up from 127,300 in 2006 and 75,000 in 2005. This represents a 1.7-fold increase between 2006 and 2007 and a 2.6-fold increase between 2005 and 2007 (Fig. 5.12).

The vast majority of children living with HIV are in 10 countries that also comprise more than 60% of pregnant women living with HIV. Uptake of antiretroviral therapy in children increased in all 10 countries between 2005 and 2007 (Fig. 5.13). The number of children receiving antiretroviral therapy increased 2.6 times in South Africa, 3 times in Kenya, nearly 4 times in Mozambique and nearly 5 times in Zimbabwe.
Fig. 5.13. Number of children (younger than 15 years) receiving antiretroviral therapy in the 10 countries with the highest estimated number of pregnant women living with HIV, 2005–2007

However, while tremendous progress has been made towards universal access to antiretroviral therapy for children in many countries, most children living with HIV who need antiretroviral therapy globally are still not receiving treatment, resulting in high rates of mortality among children younger than five years of age directly attributable to HIV. Efforts must continue to expand early infant diagnosis and the provision of treatment and care for children.
References


